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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,191	11/18/2003	Martin C. Bleck	291958191US3	4136

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EXAMINER	
ZHENG, LOIS L	
ART UNIT	PAPER NUMBER
1742	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/716,191	BLECK ET AL.	
	Examiner	Art Unit	
	Lois Zheng	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *31-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claim 31, 39 and 47 are amended in view of the claim amendments filed 23 October 2006. Claims 49-53 are canceled. Therefore, claims 31, 39 and 47 remain under examination.

Priority

2. The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 08/680,057 now US Patent No. 5,980,706, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. US Patent No. 5,980,706 does not provide support for the instantly claimed flow control structure. Therefore, the instant applicant does not benefit from the priority date of the US Patent No. 5,980,706. The priority date for the instant application is 30 September 1997.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 31-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In this case, the amended feature of "wherein the fluid passageways have a uniform size and spacing in the liquid pervious portion" as recited in instant claims 31, 39 and 47 is not explicitly or implicitly disclosed in the original specification. In addition, Fig. 42 only shows a particular cross-section of the flow control structure, therefore, is not representative of the size, shape, spacing or uniformity of the openings elsewhere on the flow control structure(i.e. diffuser plate). Page 84, line 23, to page 85, line 5 of the specification does not provide sufficient disclosure on the size, shape and spacing of the openings or discussed the claimed uniformity.

The remaining claims are rejected since they depend on rejected claims 31, 39 and 47.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 31-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "uniform size" as recited in independent claims 31, 39 and 47 is vague and indefinite since uniform size can have different meanings such as openings having the same dimensions or openings having the same contoured shape. Therefore, the meaning of the word "uniform" is unclear.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 31-35 and 37-48 are rejected under 35 U.S.C. 102(e) as being anticipated by Arken et al. US 6,001,235(Arken).

The teachings of Arken are discussed in paragraph 5 of the previous Non-Final Office Action mailed 17 August 2006. The rejection grounds are maintained for the same reasons as stated in the previous Office Action.

Regarding the amended claim feature of the fluid passageways having uniform size and spacing, the openings of the flow control structure as show in Fig. 5 of Arken have the same shape and size and spaced at equal distance from each other, therefore, read on the uniform size and spacing as claimed. In addition, since Arken teaches a flow control structure that is structurally the same as claimed flow control structure, the

examiner concludes that the openings of the flow control structure as taught by Arken are capable of reducing turbulence in the processing solution as claimed.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arken in view of Bacon et al. US 4,466,864(Bacon).

The teachings of Arken in view of Bacon are discussed in paragraph 7 of the previous Non-Final Office Action above. The rejection of instant claim 36 is maintained for the same reasons as stated in the previous Non-Final Office Action.

11. Claims 35-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacon in view of Hadersbeck et al. US 4,906,346(Hadersbeck), further in view of Grandia et al. US 4,304,641(Grandia), and further in view of Lowery US 5,472,592 (Lowery).

Bacon teaches and electroplating apparatus comprising the claimed plating vessel having the claimed inner and outer portions(Fig. 3 #31 & 46), the claimed wall between the inner and outer portions(Fig. 3 #46), the claimed electrode supported by an electrode support(Fig. 3 #61-62, 43, col. 4 lines 33-37), and the claimed head assembly having a workpiece holder (Fig. 3 #38). The apparatus of Bacon has an inlet providing electrolyte to the inner portion of the vessel(Fig. 3) and the wall between the inner and

outer portions of Bacon's electroplating apparatus functions as an overflow weir as claimed(Fig. 3 #54, col. 4 lines 24-32).

However, Bacon does not explicitly teach the claimed flow control structure between the electrode and the workpiece processing surface. Bacon also does not explicitly teach the claimed head assembly including a plurality of electrical contacts arranged to contact a peripheral of the workpiece.

Hadersbeck teaches an electroplating apparatus comprising diaphragm or porous disc located above the electrode and below the wafer(Fig. 1 #10) for uniform deposition or filtering(col. 2 lines 48-54).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the diaphragm or porous disc as taught by Hadersbeck into the apparatus of Bacon between the anode and the workpiece processing surface in order to achieve uniform deposition or filtering as taught by Hadersbeck. Therefore, the diaphragm or porous disc as taught by Bacon in view of Hadersbeck reads on the claimed flow control structure. In addition, since the plate as taught by Hadersbeck comprises a plurality of holes in the interior portion of the plate, it reads on the flow control structure having a liquid pervious portion and a liquid impervious portion disposed annularly outwardly from the liquid pervious portion as claimed.

However, Hadersbeck does not explicit teach that the openings on the diaphragm structure have uniform size and spacing as claimed.

Grandia teaches using a diffuser plate(Fig. 1#20) in an electroplating apparatus. Grandia further teaches various embodiments wherein the openings on the diffuser

plate may have different size or different spacing to control the electrolyte flow to achieve uniform plating(col. 2 line 40 - col. 3 line 6). Therefore, it is evident that the size and the spacing of the openings in a diffuser plate is a result effective variable that ultimately affect the uniformity and the thickness of the coating deposit.

Therefore, one of ordinary skill in the art would have found it obvious to have varied the size and the spacing of the openings in the diaphragm or porous disc of Bacon in view of Hadersbeck via routine optimization to arrive at the claimed uniform size and spacing, in light of the teachings of Grandia, in order to achieve desired coating thickness and uniformity.

Furthermore, since the diaphragm or porous disc as taught by Bacon in view of Hadersbeck and Grandia is structurally the same as claimed flow control structure, the examiner concludes that the diaphragm or porous disc as taught by Bacon in view of Hadersbeck and Grandia is capable of reducing turbulence in the processing solution as claimed.

Lowery teaches an electroplating apparatus comprising a plurality of electrical contacts on the head assembly that holds the workpiece substrate(Fig. 3 # 46).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the plurality of electrical contacts as taught by Lowery into the head assembly of Bacon in view of Hadersbeck and Grandia in order to evenly distribute current to the substrate as taught by Lowery(col. 8 lines 39-49).

Regarding claims 31-38, the plurality of electrical contacts as taught by Bacon in view of Hadersbeck, Grandia and Lowery read on the claimed electrical fingers

projecting from the workpiece support and the electrode support plate as taught by Bacon in view of Hadersbeck, Grandia and Lowery reads on the claimed anode shield. Therefore, the instantly claimed electroplating apparatus as recited in claims 35-38 does not structurally distinguish from the apparatus of Bacon in view of Hadersbeck, Grandia and Lowery.

Regarding claims 39-46, Lowery further teaches that the workpiece is rotated by a driving shafted which is controlled by a motor to enhance the uniformity coating thickness across the surface of the workpiece(col. 3 lines 34-50). Therefore, it would have been obvious to have incorporated the workpiece rotation mechanism as taught by Lowery into the electroplating apparatus of Bacon in view of Hadersbeck, Grandia and Lowery in order to enhance the uniformity of coating thickness across the surface of the workpiece as taught by Lowery. The remaining claim limitations are rejected for the same reasons as stated the rejection of claims 31-38 above.

Regarding claims 47-48, even though Bacon in view of Hadersbeck, Grandia and Lowery do not explicitly teach the claimed source of processing solution in fluid communication with the inner portion of the processing vessel, one of ordinary skill in the art would have found the claimed source of processing solution obvious in order to replenishing the electrolyte in the electroplating apparatus. The remaining claim limitations are rejected for the same reasons as stated the rejection of claims 31-38 above.

Response to Argument

12. Applicant's arguments filed 23 October 2006 have been fully considered but they are partially moot in view of the new rejection grounds.

Applicant's argument regarding the claimed fluid passageways having uniform size and spacing, the examiner does not consider applicant's argument persuasive since claimed uniform size can be interpreted as openings with the same dimensions and does not require the openings to be perfectly circular. Arken teaches openings on the flow control structure having the same size and same shape. Therefore, Arken teaches the claimed uniform size.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hadersbeck et al. US 4,906,346 teaches an electroplating apparatus comprising diaphragm or porous disc located above the electrode and below the wafer(Fig. 1 #10) for uniform deposition or filtering(col. 2 lines 48-54).

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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